APPENDIX D

RhodeWAYS Strategic Deployment Plan

RhodeWAYS is Rhode Island's **I**ntelligent **T**ransportation *S*ystem **(ITS)** Program for transportation management. ITS is a combination of computer and communication technologies, as well as institutional partnerships, that make existing transportation systems operate more efficiently and safely. The ITS technologies include electronic message signs, closed circuit video equipment, highway advisory radios, computerized traffic signalization systems, road weather information systems, and other devices that are used to manage, monitor and control traffic at the Transportation Management Center. Also, ITS technologies include applications for fleet management, such as Automatic Vehicle Location (AVL), to improve transit and trucking operations.

In 2001, the RI Department of Transportation produced a draft ITS Strategic Deployment Plan. This twenty-year (2020 horizon) plan provides a rationale for a work program (list of projects) that will enable **RhodeWAYS** to realize its goals in accordance with the goals of the long range ground transportation plan approved by State Planning Council (this plan).

The plan proposes an ITS roadway system (see Figure, page 4.28) based on traffic volumes and accidents to maximize benefits for the traveling public. This proposed system would contain about 218 miles of state highways. It is recognized that some other lower volume roads may be added to the ITS roadway system upon further review (e.g., Routes RI-7, US 44). However, the emphasis will remain on major road segments and other factors (e.g., inter-modal for Airport Connector/T.F. Green Airport, seasonal for Routes 4 & 1/beach traffic, and major generators for Route 138/URI Convocation Center). In addition, new facilities such as relocated Route 403 were included because of their eventual importance in the state's overall road system and the opportunity to mainstream ITS elements into their design/construction.

The ITS Strategic Deployment Plan used a system engineering process that is consistent with the national ITS planning process and helps ensure system integration. The process starts with a mission statement and a high level definition of RIDOT's vision for ITS, narrowing in focus through related goals, objectives and recommended actions. These actions are related to a system made up of one or more actual projects. Thus, every project deployed in the region can be traced back to the goals and objectives, ensuring consistency with the State Guide Plan.

The Plan identifies a series of projects that will help RIDOT achieve ITS goals for the state. These projects will directly support the implementation of Rhode Island's Statewide ITS Architecture, or will conform to this architecture. Although most of these projects are specific to RIDOT, several are multi-agency in nature.

Proposed projects are presented in four broad groups, representing major categories of ITS: Advanced Traffic Management Systems (ATMS); Advanced Traveler Information Systems (ATIS); Advanced Public Transportation Systems (APTS); and Commercial Vehicle Operations (CVO). A *description, anticipated benefits,* and *costs* are provided in the plan for each potential project.

Projects are proposed in the plan's four major ITS categories, as follows:

ADVANCED TRAFFIC MANAGEMENT SYSTEMS

Advanced Traffic Management System (ATMS) projects enhance traffic flow by improving the efficiency of the systems used to monitor and control traffic flow. These systems support incident management and the benefits reflect those from incident management activities. The ITS plan includes proposed ATMS projects that will expand the RhodeWAYS Program and provide anticipated benefits[1], as follows:

Operational Improvements:
- Travel Time Reductions ranging from 10% - 50%
- Travel Speeds Increases ranging from 10% - 60%
- Reduced Incident Clearance Times of approximately 5-10 minutes.
- Delay Reductions ranging from 17% - 37%.

Safety Improvements:
- Reduced Accident Rates of approximately 15% - 50%.
- Reduced Fatalities of approximately 10% per year.

Environmental Improvements:
- Reductions in air quality emissions (CO, HC, Nox) and reduced fuel consumption.

Projects proposed in this category include:
- **Transportation Management Center (TMC) Program Support**
- **Communications**
- **TMC System Upgrade**
- **Integration of RIDOT TMC With Other Centers**
- **RhodeWatcher Program**
- **Service Patrols**
- **ITS Field Components**
  - **Geographic Deployment Of ITS Field Components**
  - **Closed Circuit Video Equipment (CCVE) Cameras**
  - **Electronic Message Signs**
  - **Traffic Flow Monitoring Systems**
  - **Road Weather Information Systems**
  - **Integrate RIDOT Closed-Loop Traffic Signal Systems**

ADVANCED TRAVELER INFORMATION SYSTEMS

Advanced Traveler Information Systems (ATIS) projects provide travelers with information to better plan (or change) their route, departure time or travel mode. These systems are expected to provide the following improvements[2]:

Operational Improvements:
- Travel time reductions of approximately 20% during incidents
- Delay reductions of approximately 1900 vehicle hours/incident

[1] Source: US Department of Transportation
[2] US Department of Transportation

Environmental Improvements:

- Reductions in air quality emissions (VOC, HC, Nox) and reduced fuel consumption

The proposed methods to disseminate travel information to motorists include:

- Rhode Island deployment of the "511", nationwide telephone number for traveler information
- Provision of traveler information via RIDOT's website, including lane closure information, and video or "snap-shots" from highway monitoring cameras
- Facilitation of partnerships with private entities (TV and radio stations, communications firms, ATIS companies, etc.) to disseminate traveler information via the broadcast media, and to provide individualized travel information through devices such as personal digital assistants (PDA)

ADVANCED PUBLIC TRANSPORTATION SYSTEMS

Advanced Public Transportation Systems (APTS) projects enhance transit operations for transit operators and transit riders. Potential RIPTA initiatives for APTS are described in the plan.

Transit Vehicle Management

Development of key wireless sites for use by the revenue and non-revenue RIPTA fleet for voice and data communications. In addition, the RI State Police's existing digital microwave network will be upgraded and expanded to accommodate the interconnection of the wireless sites. The first site to be upgraded is located in Portsmouth, RI (Aquidneck Island).

Priority Treatment for Buses Approaching Kennedy Plaza

Installation of a system to provide transit vehicles priority at signalized intersections on the approaches to the Kennedy Plaza transit hub. Initially, this system will be installed on selected vehicles such as the "trolleys" circulating through the downtown Providence area, then expanded to other buses in RIPTA's fleet and to other locations where buses frequently encounter delays.

COMMERCIAL VEHICLE OPERATIONS

Commercial Vehicle Operations (CVO) projects focus on improving the manner that trucks are operated, registered and inspected to improve CVO safety and CVO efficiency.

CVISN Level I Deployment

Commercial Vehicle Information Systems and Networks (CVISN) refers to the collection of information systems and communications networks that support commercial vehicle operations. These include information systems owned and operated by the motor carriers, government agencies and other organizations. FHWA has recommended that Rhode Island deploy CVISN Level I capability, consisting of: Safety Information Exchange, Credentials Administration and Electronic Screening.

PRISM

The Performance and Registration Information Systems Management (PRISM) program was developed by the USDOT to target motor carriers with substandard safety records. The PRISM program consists of two major processes, the Commercial Vehicle Registration process and the Motor Carrier Safety Improvement Process (MCSIP). These processes seek to identify motor carriers and hold them responsible for the safe operation of their vehicle, and to improve the operation of unsafe carriers. Although the PRISM program is currently limited to a relatively few states, Rhode Island is participating in the PRISM program by implementing the electronic systems necessary to link the PRISM "target file" to the officers performing roadside safety inspections.

IMPLEMENTATION PLAN

The ITS Plan identifies potential funding sources, discusses procurement strategies, recommends early action items to facilitate "mainstreaming" ITS projects, and presents a preliminary twenty (20) year ITS work program.

Potential funding sources include traditional federal, state and local transportation program sources. TEA-21 provides the flexibility of mainstreaming Federal Highway Administration (FHWA) funds from the Surface Transportation Program (STP), National Highway System (NHS), as well as Congestion Mitigation and Air Quality Improvement Program (CMAQ). The Federal Transit Administration (FTA) also provides funds for projects that benefit transit operations. Innovative financing opportunities (*Variable Pricing, Direct Federal Credit)* and discretionary federal programs provided in TEA-21 that could apply to longer term ITS projects are also reviewed in the plan.

Other innovative financing opportunities are available through public/private partnerships. Partnerships have the potential of leveraging private sector revenues generated by ATIS sponsorship revenues and subscription / user fees; private sector contributions in the research and development of complementary ITS products and communication systems; sharing of communications infrastructure costs; internet applications / data-sharing revenues; etc.

Procurement Strategies

The ITS Plan recognizes that a challenge for deploying ITS projects is the selection of a procurement method that best suits the project being deployed within the context of the procuring agency or agencies. It summarizes the "lessons learned" from past studies, references the "FHWA Federal-Aid ITS Procurement Regulations and Contracting Options", and describes alternative procurement strategies and alternative bidding methods.

"Mainstreaming" ITS Projects

"Mainstreaming" ITS projects, means to facilitate the deployment of ITS by considering ITS needs and opportunities as integral components of transportation projects. The concept recognizes that ITS is a tool, similar to pavement markings and traffic signals, that RIDOT can use to promote safe, and efficient transportation of goods and people along public highways. The plan recommends that RIDOT facilitate mainstreaming of ITS components by developing a design guide providing standards and specifications that can be incorporated into RIDOT's *Standard Specifications for Road and Bridge Construction*.

ITS Work Program

The ITS Plan includes a Work Program showing phasing of projects over "short-term (five years) and "long-term" (twenty years) periods. Initial priority of the Plan is to strengthen the systems integration of the TMC operations as new equipment comes on-line. Once this objective is achieved, the focus will be to establish a communications backbone that will support enhancements to the **RhodeWAYS** Program. This will be followed by the balance of ATMS, ATIS, APTS, and CVO projects as outlined in the plan.

Implementation of proposed ITS Strategic Deployment Plan projects such as communications; center-to-center interfaces; sharing of TMC data with other agencies; signal priority for transit; and CVO initiatives will require consensus building among project stakeholders. The plan recommends that Memorandums of Understanding (MOU) be entered into among the ITS partnering agencies, and that the MOUs serve as a basis for subsequent Joint Participation Agreements (JPA) that are legally binding and more specifically define each agency's role in the development, funding, implementation, operations and maintenance of specific ITS projects.

To insure that individual projects that are inter-related will be properly sequenced, the plan's recommended projects are presented in a twenty year work program that illustrates the inter-relationship of individual projects and identifies target implementation years. Anticipated capital and operations / maintenance (O&M) are also presented in the Work Program. The O&M costs are further divided into TMC Program Support and Equipment O&M. Total costs for the recommended 20 year program are $216 million, and would require a combination of traditional, innovative, and partnership funding arrangements.